Knowledge, Attitudes, and Behaviors Related to HIV and AIDS among Female College Students in Taiwan

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Abstract:
Our purpose was to assess the knowledge and attitudes, source of HIV and AIDS information, and behaviors related to HIV and AIDS among female college students in Taiwan and to explore the factors associated with knowledge and attitudes of HIV and AIDS among female college students in Taiwan. We employed a descriptive cross-sectional design. Using a mail survey, the investigators collected data from a convenience sample of 99 female undergraduate students at a 4-year university in Taiwan. The self-administrated questionnaire included a demographic questionnaire and the International AIDS Questionnaire—Chinese Version. Our study revealed that the majority of respondents (68%) were sexually active in the last year. Findings revealed that the sexually active women had more overall HIV and AIDS knowledge and attitudes compared to those who were not sexually active. Overall, findings revealed a significant number of participants were not aware of HIV and AIDS facts and held many myths about the transmission of HIV and AIDS. Accurate HIV and AIDS information is the first step in preventing the spread of this epidemic. Ideally, the fight against AIDS should involve the family, education system, mass media, and society at large; however, the lack of necessary knowledge, values, and skills often results in ineffective and inconsistent HIV and AIDS prevention programs.
Keywords: HIV/AIDS; college students; Taiwan; Asian; knowledge; education

Article:
INTRODUCTION
Despite decades of HIV/AIDS education and prevention programs, almost 5 million people became infected with HIV in 2003, the greatest number in any one year since the beginning of the epidemic (UNAIDS, 2004). Globally, the number of people living with HIV continues to grow with an estimated 38 million people living with HIV in 2003 (UNAIDS). All regions of the world have been touched by this epidemic. The epidemic in Asia is expanding rapidly, with an estimated 7.4 million living with HIV in the region (UNAIDS). Given that Asia is home to 60% of the world's population, the fast-growing Asian epidemic has significant global implications. Several countries in this region are characterized with low per capita incomes, dramatic inequalities in income distribution, and poor health care infrastructures, making it difficult or impossible to deal with the AIDS epidemic (Twu, Huang, Lai, Ming, & Su, 2004).

Taiwan, a democratic island country off the southeast coast of the People's Republic of China, has a population of approximately 23 million people (Lin, Simoni, & Zemon, 2005). In 1986, AIDS was first reported in Taiwan from a male patient who had sex with men (MSM) (Lin et al.). As of early 2006, there were 11,481 cases of HIV infection and 2,581 cases of AIDS reported to the Centers for Disease Control in Taiwan (CDC Taiwan, 2006). Though relatively low compared to other Asian countries, the incidence of HIV infection in Taiwan has increased approximately 15% every year since 1997 (Twu et al., 2004), making this area one of the highest growing rates in Asia (Lin et al.). Demographic data on the HIV-positive population shows that 91% of this

population is male, with approximately 30% being homosexual (CDC Taiwan). These data suggest that women in Taiwan are at risk of becoming infected with HIV over the next few years through their male sexual partners.

Early in the epidemic, HIV infection and AIDS were rarely diagnosed in women. Today, the HIV/AIDS epidemic represents a growing and persistent health threat to women, especially young women. As of December 2003, women accounted for nearly 50% of all people living with HIV worldwide (UNAIDS, 2004). Young women are at risk for sexually transmitted HIV for several reasons, including biologic vulnerability, lack of recognition of their partners' risk factors, having sex with older men who are more likely to be infected with HIV, gender norms and the inability to negotiate safer sex practices within the relationship (Centers for Disease Control and Prevention [CDC], 2005). Some women may be unaware of their male partners' risk for HIV infection and may not insist on condom use owing to inequality in the relationship and/or out of fear that their partners will physically abuse them or leave them (Foreman, 2003; Gupta & Weiss, 1993; Suarez-Al-Adam, Raffealli, & O'Leary, 2000). In Taiwanese tradition, women are expected to be submissive to their father at home, their husband after marriage, and their son after the death of the husband (Yeh, 2002). Additionally, while female virginity prior to marriage and fidelity subsequent to marriage are highly valued, men visit a prostitute, which is tolerated within Taiwanese society. Wang and Lin (1996) found that 58% of male partners in Taiwan reported having visited prostitutes; however, fewer than 20% reported ever having used a condom during sexual intercourse with prostitutes. Under the influence of culture on gender roles and males engaging in high-risk sexual behavior, Taiwanese women are even more vulnerable to HIV infection.

Young people between 15 and 24 years of age account for nearly half of all new HIV infections worldwide (UNAIDS, 2004). Young people under the age of 30 make up more than 40% of the HIV-positive population currently reported in Taiwan (CDC Taiwan, 2006). The importance of focusing on young people has been recognized at a global level by the 2001 UN General Assembly Special Session on HIV/AIDS, which endorsed a number of goals for young people, including:

By 2005, ensure that at least 90%, and by 2010 at least 95% of young men and women have access to the information, education, including peer education and youth-specific education, and services necessary to develop the life skills required to reduce their vulnerability to HIV infection; in full partnership with youth, parents, families, educators and health care providers." (WHO, 2000)

College students as a population are particularly vulnerable to HIV infection. Centers for Disease Control and Prevention in a recent report states that the "epicenter of the [HIV/AIDS] epidemic is college students" (CDC, 2004). Incidents of risky sexual behaviors are prevalent among college students, much of which occurs under the influence of drugs and alcohol (CDC, 2004; UNAIDS, 2004). In a sample of Taiwanese college students, Chen (2003) reported that 63% of the respondents had sexual intercourse, with the majority having their first sexual encounter during their college years (Lin et al., 2005). Though Taiwanese are some of the least sexually active people in the world, according to the Global Sex Survey conducted annually by Durex (2005), the prevalence of unprotected sex is greater in Taiwan than in most other Asian countries, with 38% of Taiwanese reportedly having had unprotected sex without knowledge of their partner's sexual history, and the average age of first intercourse was reported at 18.5 years (Lin et al.).

Research on HIV/AIDS knowledge among college students has consistently shown that knowledge alone does not predict safe sex practices (Anastasi, Sawyer, & Pinciaro, 1999; Gupta & Weiss, 1993; Lewis, Malow, & Ireland, 1997; Opt & Loffredo, 2004). According to the Health Belief Model (HBM), the likelihood of engaging in at-risk health behaviors is influenced by attitudes and beliefs that motivate behavior; however, all behaviors are mediated by individual, social, and environmental factors. The HBM hypothesizes that knowledge factors (e.g., perceived susceptibility and perceived severity of a disease) are important to preventing at-risk health behaviors and that these factors are influenced by perceived benefits and barriers to preventative activities. According to the HBM, the likelihood of taking preventative action is determined by one's perceived risk and the sum of pros and cons he or she perceives in taking action; however, many factors may contribute to these assessments.

Given the complexity surrounding one's decision to act responsibility to prevent the transmission of HIV among college students, the purposes of the study were (1) to assess the knowledge and attitudes, source of HIV and AIDS information, and behaviors related to HIV and AIDS among female college students in Taiwan and (2) to explore the factors associated with knowledge and attitudes of HIV and AIDS among female college students in Taiwan.

METHODS

Design and Sample

A descriptive cross-sectional study design was used. A self-administered questionnaire was used to obtain data from female college students. The subjects were recruited from a 4-year university in the southern Taiwan area. Eligible subjects were included if they were (1) aged 18 years or older, (2) able to read Chinese, and (3) female undergraduate students in non-health-related majors.

Data Collection Procedures

Following university ethical approval, a complete list of potential participants' names and addresses was provided for the investigators by the university. Surveys with a self-addressed and stamped return envelope were mailed to 894 female students. A cover letter accompanying the questionnaire explained the purpose of the survey and asked for voluntary participation. Participants were also informed of confidentiality and anonymity. A reminder postcard was sent to students within 3 weeks to increase response rate. The completed questionnaires were returned in a sealed envelope directly to the investigatora and were taken as consent to participate.

Instrument

Demographic Questionnaire

The questionnaire included age, year in school, marital status, income, student status, employment status, health perception, religion, religious level, smoking level, drug use, alcohol use, source of HIV/AIDS information, age at first sexual intercourse, sexually active in the last year, and number of sexual partners during lifetime.

The International AIDS Questionnaire—Chinese Version

The International AIDS Questionnaire—Chinese Version (IAQ-C) (Davis, Tang, Noel, & Chan, 1999) was used to measure HIV/AIDS knowledge and attitudes among female college students in Taiwan. The 18-item IAQ-C assesses four dimensions of HIV and AIDS: transmission myths, facts, attitudes, and personal risk. Each item was scored on a 5-point Likert scale (1 = Strongly Agree, 2 = Agree, 3 = Don't Know, 4 = Disagree, 5 = Strongly Disagree). A total score of the IAQ-C ranges from 18 to 90, and subscales scores range from 7 to 35 for transmission myths, 5 to 25 for attitudes, and 3 to 15 for personal risk and facts. Higher scores indicate positive and accurate views on HIV and AIDS in this study. The IAQ-C total scale had a Cronbach's coefficient alpha of .76 (Davis et al., 1999). The test-retest reliability was accomplished with a sample of 21 Chinese university students at a 2-week interval and was found to be .74. In the present study, the Cronbach's alpha coefficient was .83 for the total 18 items, .90 for the transmission myths subscale, .71 for the attitudes subscale, .55 for the personal risk subscale, and .59 for the facts subscale.

Data Analysis

The data were analyzed using SPSS (Statistical Package for the Social Science) version 12.0 for Windows. The mean, standard deviation, percentage, and frequency distribution were performed to descriptively analyze the demographic variables, the knowledge and attitudes, source of HIV and AIDS information, and behaviors related to HIV and AIDS. Independent t-test and one-way analysis of variance (ANOVA) were used to examine the differences in the total IAQ-C scores among different demographic subgroups (i.e., marital status, student status, employment status, religion, sexually active in the last year, and number of lifetime sexual partners). A post hoc Tukey's test was applied to determine which specific pairs of means differed significantly from one another in the total IAQ-C scores. Pearson's correlation and Spearman's rho were used to evaluate the

relationships between the total IAQ-C scores and students' age, year in college, income, health perception, religious level, smoking level, drug use, alcohol use, and age at first sexual intercourse. Reliability analyses were used to measure the internal consistency of the instruments. For all analyses in this research, a level of $p < .05$ was employed to determine statistical significance.

RESULTS

A total of 99 female college students completed the questionnaire and returned it to the investigators, yielding a response rate of 11 %. Table 1 shows the demographic characteristics of the 99 respondents. The mean age of participants was 25.82 (SD = 6.47) years ranging from 18 to 54 years old. Of the 99 participants, most were sophomores (36.4%), were single (62.6%), were working full-time (55.6%), were part-time students (71.7%), and had a religious affiliation (71.7%).

Participants' mean age of having the first sexual experience was at the age of 19.62 (SD = 2.56) ranging from 15 to 28 years. Abut 68.7% of the participants were sexually active in the last year. The average number of sexual partners during lifetime was two ranging from one to four with 46.7% having only one sexual partner and 53.3% having more than two sexual partners.

Knowledge and Attitudes about HIV and AIDS

Sources of HIV/AIDS Information

Eight primary sources of HIV/AIDS information were reported by respondents. Television was the most popular source (73.7%) followed by newspaper (59.6%), health professionals (59.6%), radio (59.6%), Internet (55.6%), school teacher (45.5%), friends (28.3%), and family (18.2%).

IAQ-C Results

Table 2 and Table 3 show the knowledge and attitudes of HIV and AIDS among Taiwanese college female students. The average of all 18 items from the IAQ-C was calculated to indicate general knowledge and attitudes of HIV and AIDS. The mean score of general knowledge and attitudes of HIV and AIDS for all participants was 3.70 (SD = .68). The mean scores of each of four subscales were 4.07 (SD = 1.07) for transmission myths, 3.60 (SD = 1.09) for facts, 3.72 (SD = 1.03) for personal risk, and 3.89 (SD = .74) for attitudes.

Transmission Myths

Findings on HIV/AIDS transmission myths indicated that more than 25% of the participants agreed that mosquitoes can transmit HIV, approximately 23% agreed that swimming pools can spread HIV, 21% agreed that sharing cigarettes can contact HIV/AIDS, 17% agreed that HIV/AIDS can be spread through coughing and sneezing and through the air, 14% agreed that HIV can be contacted through toilet seats, and 12% agreed that hugging an infected person can spread HIV/AIDS.

TABLE 1. Demographic Characteristics of Survey Respondents (*N* = 99)

	Number	Percentage
Note. [a]U.S. $1.00 = NT $32.00.		
Year in college		
Freshman	23	23.2
Sophomore	36	36.4
Junior	11	11.1
Senior	29	29.3
Marital status		
Single	62	62.6
Married	34	34.3

TABLE 1. Demographic Characteristics of Survey Respondents (*N* = 99)

	Number	Percentage
Divorced	3	3.0
Monthly income[a]		
< NT10000	4	4.4
NT10,001-20,000	3	3.0
NT20,001-30,000	8	8.1
NT30,001-40,000	6	6.1
> NT40,000	16	16.2
Prefer not to say	62	62.6
Student status		
Full time	28	28.3
Part time	71	71.7
Employment status		
Full time job	55	55.6
Part time job	32	32.3
No job	12	12.1
Health perception		
Poor	3	3.0
Fair	50	50.5
Good	25	25.3
Very good	14	14.1
Excellent	7	7.1
Religion		
Buddhist	26	26.3
Christian	20	20.2
Hindi	21	21.2
Shinto	3	3.0
Muslim	1	1.0
None	28	28.3
Religious level		
Very religious	28	28.3
Some religious	32	32.3
Little religious	25	25.3
Not at all	14	14.1
Smoking level		
Everyday	8	8.1
Sometimes	26	26.3
Not at all	65	65.7
Drug use		
Occasionally	8	8.1
Not at all	91	91.9

TABLE 1. Demographic Characteristics of Survey Respondents (*N* = 99)

	Number	Percentage
Alcohol use		
Sometimes	58	58.6
Not at all	41	41.4

Note. [a]U.S. $1.00 = NT $32.00.

Facts

Participants' views of factual information on HIV/AIDS revealed that more than 29% of the participants were unaware that condoms would decrease the risk of HIV transmission, 13% were unaware that HIV can be transmitted from mother to baby, and 56.3% were unaware that HIV can be spread through infected sperm.

Personal Risk

Findings on personal risk demonstrated that 31% of the participants agreed that AIDS affected only intravenous drug users, 14% agreed that Asians are less susceptible of contacting to AIDS than Westerners, and 18% believed that vaccination can protect themselves against AIDS.

Attitudes

Participants' attitudes toward AIDS indicated that 24% were unwilling to do volunteer work with AIDS patients. About 23% participants agreed that people with HIV should stay home or in a hospital. Less than 10% of the participants thought that people with HIV should be kept out of school or they would end a friendship if their friend had AIDS or family member who contacted HIV should move out of the home.

TABLE 2. HIV and AIDS Knowledge and Attitudes Among Female College Students in Taiwan (*N* = 99)

Item on IAQ-C	Mean[a]	SD
Note: [a]Based on 5-point Likert scale format, 1 = Strongly Agree, 2 = Agree, 3 = Don't Know, 4 = Disagree, 5 = Strongly Disagree. Higher scores indicate more positive and accurate views on HIV.		
*Item scores were revised.		
Transmission myths	4.07	1.07
HIV can be spread through coughing and sneezing	4.17	1.43
AIDS can be contacted through sharing cigarettes	3.95	1.50
HIV/AIDS can be spread through hugging an infected person	4.41	1.78
HIV can be transmitted through the air	4.25	1.31
HIV can be spread through swimming pools	3.90	1.40
HIV can be contracted through toilet seats	4.16	1.25
Mosquitoes can transmit HIV	3.67	1.50
Facts	3.60	1.09
Condoms will decrease the risk of HIV*	3.61	1.56
HIV can be transmitted from mother to baby*	4.12	1.32
HIV is spread through infected sperm*	3.08	1.52
Personal risk	3.72	1.03
Asians are less susceptible of contacting AIDS than are Westerners	4.01	1.17
AIDS only affects intravenous (IV) drug users, prostitutes and homosexuals	3.23	1.72
You can protect yourself against AIDS by being vaccinated for it	3.94	1.39

TABLE 2. HIV and AIDS Knowledge and Attitudes Among Female College Students in Taiwan (*N* = 99)

Item on IAQ-C	Mean[a]	SD
Attitudes	3.89	0.74
People with HIV should be kept out of school	4.27	1.13
Would end my friendship if my friend had AIDS	4.07	1.08
I am willing to do volunteer work with AIDS patients*	3.08	1.06
If a family member contracts HIV he/she should move out	4.31	0.99
People with HIV should stay home or in a hospital	3.75	1.26

Note: [a]Based on 5-point Likert scale format, 1 = Strongly Agree, 2 = Agree, 3 = Don't Know, 4 = Disagree, 5 = Strongly Disagree. Higher scores indicate more positive and accurate views on HIV.

*Item scores were revised.

Factors Associated with Knowledge and Attitudes of HIV and AIDS

The results from one-way ANOVA and Tukey's post hoc test show that participants working full-time (M = 70.31, SD = 9.28) had a significantly higher total IAQ-C score than participants working part-time (M = 61.38, SD = 14.49), F (2, 84) = 5.43, p = .01.

TABLE 3. Total Mean Score of Subscale and IAQ-C (*N* = 99)

	Mean	SD	Range
Transmission myths	28.35	7.58	7-35
Facts	10.80	3.26	3-15
Personal risk	11.06	3.19	3-15
Attitudes	19.16	3.95	5-25
IAQ-C	69.38	11.91	18-90

Independent t-test results show that participants who were sexually active in the last year (M = 67.26, SD = 11.96) had a significantly higher total IAQ-C score than participants were not sexually active in the last year (M = 54.50, SD = 12.53), t = 2.49, p = .02. The IAQ-C dimension of attitudes toward HIV and AIDS revealed a significant difference between participants with different number of sexual partners during lifetime. Those with more than one partner (M = 19.83, SD = 3.63) had a significantly higher attitudes score than those who had only one partner (M = 17.83, SD = 4.34), t = 2.20, p = .03. There were no significant differences in the total IAQ-C scores between marital status subgroups, student status subgroups, religion subgroups, and number of sexual partners during lifetime.

The results of the Spearman's rho suggest that the total IAQ-C scores were significantly and positively related to students' year in college ($r_s(99) = .42$, $p < .01$), indicating that participants who had more years in college were more likely to have positive and accurate views on HIV and AIDS. The total IAQ-C scores were significantly and negatively related to students' smoking level ($r_s(99) = -.31$, $p < .01$), indicating that participants who were smoking less were more likely to have positive and accurate views on HIV and AIDS. There was no significant correlation between the total IAQ-C scores and participants' age income, health perception, religious level, drug use, alcohol use, and age at first sexual intercourse.

DISCUSSION

The aim of the current study were (1) to assess the knowledge and attitudes, source of HIV and AIDS information, and behaviors related to HIV and AIDS among female college students in Taiwan and (2) to explore the factors associated with knowledge and attitudes of HIV and AIDS among female college students in

Taiwan. Prior to discussing the results, it is important to consider several limitations of the study. The current study relied on a non-probability sample of Taiwanese college females, which limits the generalizability of the results, especially given the low response rate. Our study attempted to minimize, but could not rule out, the shortcomings of the self-reported method, which may be subject to self-selection, social desirability, and recall bias. Despite these limitations, the results of the study provide important information on HIV and AIDS knowledge and attitudes among college women in Taiwan, which has significant implications for AIDS prevention in this country.

Despite this sample's being a highly educated group of college women in Taiwan, their knowledge of HIV and AIDS information was surprisingly poor. For example, a significant number of the respondents thought that HIV could be transmitted by mosquitoes (25%), swimming pools (23%), sharing cigarettes (21%), coughing or sneezing in the air (17%), toilet seats (14%), and hugging an infected person (12%). Furthermore, more than half the sample was unaware that HIV is spread via infected sperm, and nearly 30% were unaware that condoms would decrease the risk of HIV transmission. Other HIV and AIDS myths held by a significant number of respondents included that AIDS affected only IV drug users (31%) and that a vaccine could prevent AIDS (18%).

The most popular source of HIV and AIDS information was television followed by newspapers, health professionals, radio, internet, and school teachers. Accurate HIV and AIDS information is the first step in preventing the spread of this epidemic. Further analysis of Taiwanese society's stance towards HIV/AIDS, including media representations and government policies would be instructive. Of particular significance would be the provision of accurate HIV and AIDS education in public schools at the secondary and university level, given that fewer than half of the respondents reported teachers as a source of HIV and AIDS information. Earlier studies from Taiwan found that though the textbook includes the reproductive system and sex information, some teachers in secondary schools avoid giving instructions and ask students to read the text for themselves because of teacher's discomfort with the subject of sex (Tsai & Wong, 2003; Yeh, 2002). In recognition of the fact that sex education is not sufficient in schools, Department of Health (DOH) in Taiwan (2006) has launched several campaigns to prevent and control AIDS/HIV by stressing the importance of safe sex. For instance, the DOH has established 33 teen health centers throughout the island, where medical advice, consultation and referral services are provided for teens seeking help or interested in finding out more about safe sex. The DOH also has set up a sex education Web site at http://www.young.gov.tw. This Web site has reached page views of about 500,000 per year—an indication that more and more youths are visiting the site to get information on safe sex or to seek online help. Nevertheless, the inadequacy of formal instructions on sex education has forced youth to depend on informal channels (e.g., Internet and newspaper) and might lead to significant obstacles to a full understanding of safe sex practice. Research has shown that people need a solid factual understanding of HIV and its transmission, access to relevant services and supplies, and the confidence and social power to initiate and sustain behavioral change in order to prevent the spread of HIV and AIDS (Gupta & Weiss, 1993). Ideally, the fight against AIDS should involve the family, education system, mass media, and society at large; however, the lack of necessary knowledge, values and skills often results in ineffective and inconsistent HIV and AIDS prevention programs.

Similar to previous studies on sexual activities among Taiwanese college students (Chen, 2003), our study revealed that the majority of respondents (68%) were sexually active in the last year. Findings revealed that the sexually active women had more overall HIV and AIDS knowledge and attitudes compared to those who were not sexually active. Though knowledge is an essential first step in the fight against HIV and AIDS, previous research of HIV/AIDS knowledge among college students has consistently shown that knowledge alone does not predict safe sex practices (Anastasi et al., 1999; CDC, 2004; Gupta & Weiss, 1993; Lewis et al., 1997; Opt & Loffredo, 2004).

Our study focused on HIV and AIDS knowledge; however, further intervention-based research needs to be conducted on how to increase safe sex practices among this vulnerable population and increase condom self-efficacy. AIDS and HIV prevention programs have been the primary focus of controlling the spread of this

disease since the epidemic was discovered, but effective programs require the understanding of the target groups' characteristics, their particular stage of needs, and predicting factors specific to their behavior change. Future studies should focus on further understanding the social, cultural, and psychological factors that hamper safe sex practices among this population as well as successful intervention strategies to overcome these barriers.

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